Docket No.: 1422-0635PUS1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:
Masayoshi HANDA et al.

Application No.: 10/501,507 Confirmation No.: 008270

Filed: July 15, 2004 Art Unit: 1713

For: PROCESS FOR PRODUCING WATER-ABSORBING RESIN EXAMINER: BERNSHTEYN, Michael

DECLARATION UNDER 37 C.F.R. 1.132

COMMISSIONER FOR PATENTS
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Sir:

I, Hideki YOKOYAMA, residing in Hyogo-ken, Japan, hereby declare and state as follows:

1. I am thoroughly familiar with the contents of said U.S. Application Serial No. 10/501,507 filed on July 15, 2004, entitled PROCESS FOR PRODUCING WATER-ABSORBING RESIN, its prosecution before the United States Patent and Trademark Office and the references cited therein.

2. I received a master's degree from Osaka Prefecture University of Japan, in the year 1997, majoring in Chemical Engineering.

3. I have been employed in Sumitomo Seika Chemicals Co., Ltd. in the year 1997 and have been assigned to the Research Laboratories.

4. I have been involved in the research and development of water-absorbent resin since 1997.

5. The following experiments were conducted by myself or under my direct supervision and control in order to verify that the water-absorbent resin obtained in the present invention is distinguishable from the combined references of EP0889063 A1 (hereinafter simply referred to as "EP'063")

EXPERIMENTAL METHOD

Follow-up Experiments of Cited References

The follow-up Experiments of EP'063

The follow-up experiment of EP'063 was carried out in the following manner.

The Sample of EP'063 was prepared by the same manner as in Example 1 of EP'063 as detailed below.

Specifically, first, a metal compound was prepared. To an ice-cooled solution of 10.9 g of sodium gluconate in 37.5 g of ion-exchanged water was added dropwise 5.0 g of titanium tetrachloride and mixed. After confirming that the solution turned clear, 10.9 g of a 30% aqueous sodium hydroxide solution was added dropwise thereto to adjust the solution to pH 7. The resulting solution was clear and slightly yellow.

Next, a superabsorbent resin and a superabsorbent resin composition were synthesized. In a 1000 ml five-necked cylindrical rounded bottom flask equipped with a stirrer, a reflux condenser, a dropping funnel, and a nitrogen gas inlet tube were charged 400 ml of cyclohexane and 0.625 g of ethyl cellulose

(trade name: Ethyl Cellulose N-100, manufactured by Sigma-Aldrich) as a dispersant. Nitrogen gas was blown into the mixture to drive out dissolved oxygen and the contents of the flask were raised to 75°C.

In a separate flask, 102.0 g of acrylic acid was diluted with 25.5 g of ion-exchanged water, and the solution was neutralized with 140 g of a 30% aqueous sodium hydroxide solution while cooling from outside. Next, thereto was added a solution of 0.204 g of potassium persulfate in 7.5 g of water to dissolve, and thereafter nitrogen gas was blown into the solution to remove oxygen dissolved in the aqueous solution. The contents of this flask were added dropwise to the above five-necked cylindrical rounded bottom flask over 1 hour to polymerize.

After the completion of polymerization, the reaction mixture was azeotropically dehydrated by the use of a dehydrating tube so as to adjust the water content of the resulting superabsorbent resin to 30 parts by weight per 100 parts by weight of the superabsorbent resin. Then a solution of 0.04 g of polyglycerol polyglycidyl ether (trade name: Denacol EX-512, manufactured by Nagase ChemteX Corporation) in 4 g of water was added thereto as a crosslinking agent, followed by allowing the mixture to react at 75° to 80°C for 1 hour. After cooling, cyclohexane was removed by decantation, to give 125 g of a water-containing superabsorbent resin.

The amount 125 g of the resulting water-containing superabsorbent resin was put in a twin-cylinder kneader, and the entire amount of a mixture prepared by previously adding 1.9 g of the aqueous metal compound solution obtained above (equivalent to 0.03 parts by weight per 100 parts by weight of the superabsorbent resin) to 6.25 g of a 10% by weight aqueous sodium tripolyphosphate solution (equivalent to 0.5 parts by weight per 100 parts by

weight of the superabsorbent resin) while mixing was sprayed thereto, and the components were sufficiently stirred and mixed. Further, the reaction mixture was dried under heating and reduced pressure conditions of 80°C to 100°C and 50 Torr for 1 hour, and particles having sizes of 850 μm or larger were excluded with a sieve to obtain a superabsorbent resin. (Sample of EP'063)

Sample A

The entire 30g of the superabsorbent resin obtained above (Sample of EP'063) was placed in a 1000-ml five-necked cylindrical round bottomed flask equipped with a stirrer, and 0.51 g of a 3% by weight aqueous sodium sulfite (reducing agent) solution was added thereto while mixing, to give a superabsorbent resin composition. The water-absorbent resin composition contained a metal chelating agent ascribed to Sample of EP'063 as shown in Table I (Sample A).

Sample B

The entire 10 g of the superabsorbent resin obtained above (Sample of EP'063) was mixed 10 g of sodium sulfite (reducing agent), to give a water-absorbent resin composition. The superabsorbent resin composition contained a metal chelating agent ascribed to Sample of EP'063 as shown in Table I (Sample B)

The yellow index was measured according to the method described in the present specification for the obtained superabsorbent resin composition of the follow-up experiments of EP'063. (Samples A & B)

RESULTS AND DISCUSSION

The results of the follow-up experiment are shown in Table I. Also, the results of Example 3 described in the specification are also shown together.

Table I

	Reducing Agent (Sodium Sulfite)	Metal Chelating Agent	Yellow Index	
			After Production	50°C, 90% RH After 20 Days
Example 3 of the Present Invention	Added After Polymerization (Gelated) 0.0625%*1	Added After Polymerization (Gelated) 0.0625%	7.4	8.2
Sample of EP'063	Not Added	Sodium Tripolyphosphate	12.0	21.2
Sample A	Added After Drying 0.0625%*1	Sodium Tripolyphosphate	11.7	26.3
Sample B	Added After Drying 50%*2	Sodium Tripolyphosphate	10.9	71.4

*1...by weight based on acrylic acid

*2...amount of weight based on total weight superabsorbent resin composition.

(EP'063 disclosed at page 8 line 10-13)

It can be seen from Table I that the superabsorbent resin of EP'063 with or without reducing agent after having allowed to stand for 20 days at 50°C and 90% relative humidity have an yellow index exceeding 12.

In other words, in the superabsorbent resin of EP'063 with or without reducing agent, an equivalent level of an effect of preventing coloration to that of

the water-absorbent resin obtainable according to the present invention cannot be obtained.

In conclusion, it is evident from the above results that the present invention exhibits an advantageous effect of preventing coloration, and one of ordinary skill in the art would not have easily arrived at such an effect from the disclosures and teachings of EP'063.

Statement Under 18 U.S.C. § 1001

The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Hideki Yokoyama

Hideki YOKOYAMA

December 25, 2008

Date